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## 1. Introduction

The Supershaft Plus system is intended to be used as a temporary waling system to sheeted excavations. It is not intended for other purposes.

The product is frequently used in combination with:

- Super Shaftbrace waling system.
- Multibrace waling system.
- Super bracing strut.
- Mechanical bracing strut.

Details can be found in the relevant User Information.

This booklet provides basic information for users of Supershaft Plus to assist them in their preparation of a safe system of work on site.

Supershaft Plus should NOT be used in seawater applications without prior consultation with Mabey Hire Services.

## 2. Design

No information on design is included in this booklet.

Clients are strongly advised to ensure that a competent engineer is employed to provide a suitable design for excavation schemes requiring the use of Supershaft Plus products.

Mabey Hire Services offer a design service and can, on request, also provide information on the strength capacities of Supershaft Plus products for clients undertaking their own designs.

## 3. Frame Dimensions

This booklet gives information for frame dimensions for Supershaft Plus Walings. When Supershaft Plus is used in combination with Super Shaftbrace or Multibrace, consult Mabey Hire Services staff for frame dimensions.

## 4. Hydraulic Adjustments

The Supershaft Plus system incorporates a hydraulic system of adjustment which is designed to extend or retract the frames under conditions of no or low loading: e.g. as when first installed or as they become redundant after backfilling the excavation.

Once they are sustaining significant ground loads, hydraulic extension or retraction of the frames is inadvisable and is unlikely to be possible. Methods of working should therefore avoid the need for frame adjustment/removal whilst the walings are heavily loaded.

## 5. General Guidance Notes

### 5.1 Safe System of Work and Method Statement

Assuming that the location, plan size and depth of an excavation, together with an arrangement of sheets and frames has already been determined, the Health and Safety at Work Act requires that a safe system of work is adopted to carry out the work on site.

These guidance notes are intended to draw the client's attention to practical aspects of Supershaft Plus installation which need to be considered in drawing up method statements for a safe system of work.

In particular, the client's attention is drawn to the lengths and weights of the frame members and the need for planning the lifting operations involved.

All major components of the Supershaft Plus system are fitted with lifting lugs for safe slinging.

Regular users of Mabey Hire Shaftbrace, Multibrace and Super Shaftbrace systems should note that Supershaft Plus system components are considerably heavier.

Two methods of constructing a typical excavation using Supershaft Plus are given on pages 9 & 10.

### 5.2 Manpower

The Health and Safety legislation requires that personnel deployed are suitably trained and experienced and supervised by a competent person.

The main activities associated with Supershaft Plus installation are:

- Unloading the delivery vehicle.
- Bolting up and pinning steelwork together to form walings of the required length.
- Slinging and lifting walings into position in the excavation, and connecting the corners to form frames.
- Connecting the pump to each waling in turn, pressurising the frames and fitting restraint chains.

### 5.3 Plant and Lifting

A suitable appliance is required for off-loading and installation. For off-loading there needs to be sufficient clearance under the main hook to allow lifting with a safe angle between the lifting sling legs.

**WARNING:** If an excavator is being used for lifting operations refer to safety information on Page 4.

If the walings are to be lifted into the excavation then the appliance should be located a safe distance from the edge of the excavation and the lifts and radii checked against the safe lifting capacities of the appliance.

A surcharge for the excavator must have been allowed for in the excavation brief / design.

In this booklet it is assumed that the frames will be lifted into the excavation one leg at a time and assembled in the excavation. Likewise for removal it is assumed that the frame will be dismantled in the excavation and the legs removed one at a time. See pages 9 and 10 for further details.

### 5.4 Small Plant, Tools and Lifting Chains for Handling

Essential equipment requirements are:

A compressor with 100 p.s.i. output and sufficient length of air line to power the pump. The pump is fitted with a standard 1/2" BSP air hose claw connector.

Sledgehammers for making pinned connections.

Podgers/spanners for making bolted connections. (Bolt sizes are M30 for walings).

Lifting chains of suitable length and capacity and with current certification. The walings have lifting lugs designed to take 16mm safety hooks.

In most cases the centre of gravity of the lifts involved will not be at mid-length so shortening clutches are advisable. Mabey Hire Services offer sets of 2 leg chains with these fittings and 5m long chain legs for hire - though clients should check that the leg length is suitable to use with their lifting appliance.

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## 5.5 Access Hard Standing Areas and Site Storage

These include:

- Suitable area to off-load the lorry and assemble the walings.
- Suitable hard standings for the lifting appliance to operate from if it is intended to lift the walings into the excavation.
- Ladders and possibly other provisions to provide safe access into the excavation to install restraint chains and

## 5.6 During Excavation Works on Site

If Mabey Hire Services have designed the sheeting and frame arrangement for the excavation they will have used ground data provided by the client.

If during the excavation it is noted that the actual ground conditions and/or ground water levels differ from those provided at design stage it is advisable to have the scheme rechecked.

## 5.7 After Excavation Works are Completed

Plan for edge protection to be installed as early as possible. Regularly inspect the excavation for signs of excessive movements of sheets or walings. Check the hydraulic walings for signs of fluid leakage. Keep plant, spoil heaps and stored materials well clear from the edge of the excavation.

## 5.8 Return of Equipment Off Hire

Clients should ensure that on removal, the equipment is returned clean in lengths as supplied.

## 5.9 Transportation

Ensure all equipment is loaded to the satisfaction of the lorry driver and is securely chained/strapped to the lorry.

## 5.10 References

### 5.10.1 Legislation

The Health & Safety at Work Act 1974  
The Management of Health and Safety at Work Regs (M.H.S.W.) 1999  
The Construction (Design and Management ) Regulations 2007  
The Control of Substances Hazardous to Health (COSHH) Regulations 1994  
The Lifting Operations and Lifting Equipment Regulations (LOLER) 1998  
The Provision and Use of Work Equipment Regulations (PUWER) 1998  
Work at Height Regulations 2005  
Noise  
Manual Handling

### 5.10.2 HSE Guidance

Health and Safety in Construction (HSG150 - rev)  
A Guide to Managing Health and Safety in Construction (ISBN 0 7176 0755 0)  
Health and Safety in Excavations - Be Safe and Shore (HSG185)  
Safe Work in Confined Spaces - Regulations, Approved Code of Practice and Guidance (L101)  
Five Steps to Risk Assessment (INDG 163)  
Excavators Used as Cranes - Guidance Note PM42

### 5.10.3 Other Guidance

CPA Guidance                Safety in Shoring - The Proprietary Shoring and Piling Equipment Manual  
CPA (STIG) Guidance    STIG 0201 : Selection of Proprietary Shoring Equipment  
CPA (STIG) Guidance    TIN 203 : The Use of Restraining Chains to Support Shoring Equipment  
CPA (STIG) Guidance    TIN 204 : The Correct Use of Lifting and Other Attachment Points for Shoring Equipment  
CPA Safety Guidance    Risk Assessment (SG 003)  
CPA Guide Ref No. SG001(3)    Guidance on Lifting Operations in Construction When Using Excavators  
CIRIA Report R166        CDM Regulations - Work Sector Guidance for Designers  
CIRIA Report 97            Trenching Practice  
CIRIA Special Publication 131    Crane Stability on Site  
CIRIA Special Publication 95    The Design and Construction of Sheet-Piled Cofferdams

### 5.10.4 British and European Standards

BS 6031 : 2009 Code of Practice for Earthworks  
BS EN 996 : 1996 Piling Equipment. Safety Requirements  
BS EN 1997-1 : 2004 Code of Practice for Foundations  
BS 5228-1 : 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites : Noise  
BS 5228-2 : 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites : Vibration



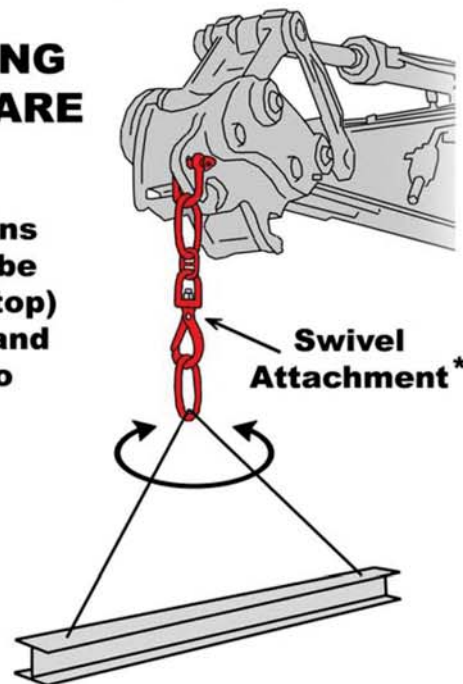
## 6. Sling Warning



### IF YOU ARE USING A SLING ON AN EXCAVATOR BEWARE THE FOLLOWING :-

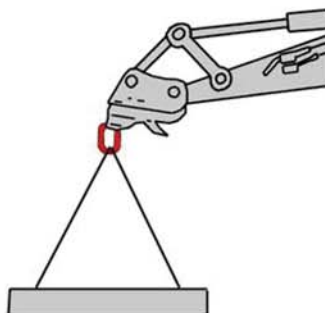
It is very important that a means of allowing the sling to swivel be introduced above the master (top) ring. This will allow the sling, and in particular the master ring, to turn and align with the load.

**WITHOUT A SWIVEL ARRANGEMENT THE LOAD MAY SEVERELY TWIST THE MASTER RING RESULTING IN DAMAGE OR FAILURE.**

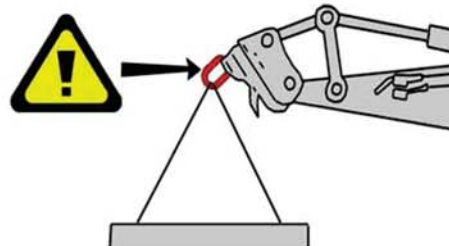


All lifting accessories attached to the excavator lifting point must hang freely and be free to move at all times.

**TILTING THE HEAD OF THE DIPPER ARM / QUICK HITCH UPWARDS MAY PREVENT FREEDOM OF MOVEMENT AND SO TWIST, DAMAGE OR FAIL THE LIFTING EQUIPMENT.**



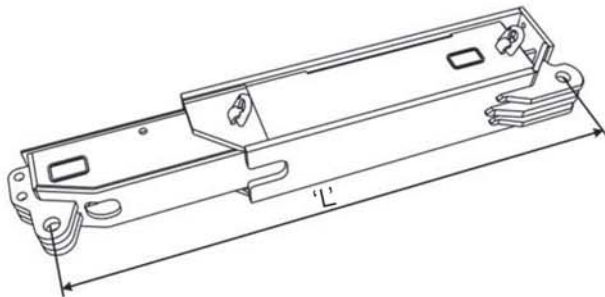
**CORRECT**



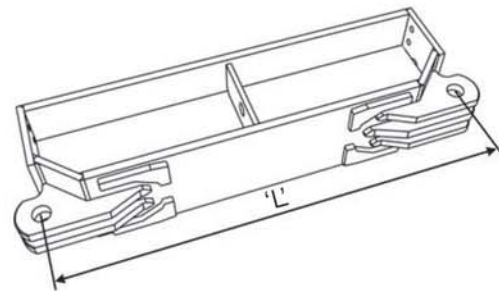
**INCORRECT**

\* Mabey Hire Services offer an 8 tonne single leg swivel attachment as part of their hire product range.  
Code : SSBA-007, Bearing to bearing length : 600mm, Weight : 11kg. Please see User Guide for details.

## 7. Identification of Components

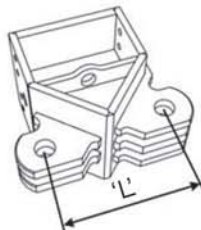


Ram Unit			
Code	Length 'L' (mm)		Weight (kg)
	Min.	Max.	
SSP-HYDUNIT	2000	2800	1925

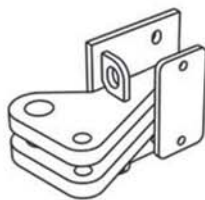


Intermediate Extension		
Code	Length 'L' (mm)	Weight (kg)
SSP-1	1000	558
SSP-125	1250	651
SSP-2	2000	950
SSP-5	5000	2093
SSP-7	7000	2865
SSP-10	10000	4038

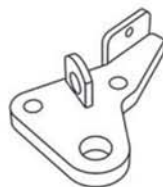
Note : All extensions 2000mm long and above are fitted with shear keys at both ends.



End Extension		
Code	Length 'L' (mm)	Weight (kg)
SSP-05	500	358



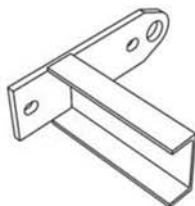
**3 / 2 Connector Plate**  
Code : SSP-3/2CONNPLT  
Size : 585 x 345 x 460 mm  
Weight : 116.6 kg



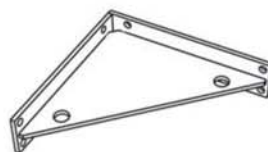
**2 / 1 Connector Plate**  
Code : SSP-2/1CONNPLT  
Size : 535 x 370 x 230 mm  
Weight : 45.2 kg



**Corner Unit Plate**  
Code : SSP-CORNPLT  
Size : 370 x 280 x 50 mm  
Weight : 16.3 kg



**Corner Unit Bracket**  
Code : SSP-CORNUNIT  
Size : 535 x 420 x 180 mm  
Weight : 20 kg



**Angle Bracket**  
Code : SSP-ANGBRKT  
Size : 600 x 600 x 140 mm  
Weight : 39 kg



**Extension Pin**  
NOTE : requires 2 x SSP-M16BOLT  
Code : SSP-EXTPIN  
Length : 355 mm  
Diameter : 80 mm  
Weight : 13 kg

# product user guide

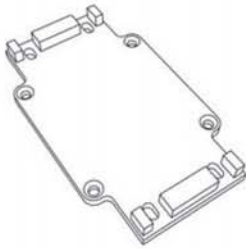
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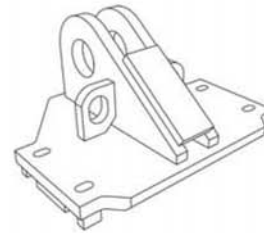
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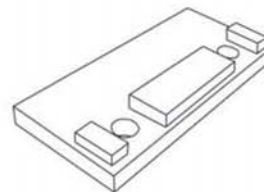
Connector Plate  
(Super Bracing Strut to Supershaft Plus)  
Code : SBS-031  
Size : 570 x 340 x 20  
Weight : 29.2 kg



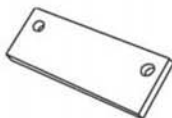
Supershaft Plus Female Knee Brace  
Connector Bracket Assembly  
Code : SBS-032  
Size : 570 x 465 x 245  
Weight : 141 kg

**Not  
Currently  
Available**

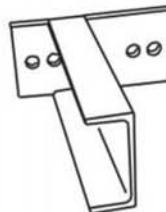
Supershaft Plus Raking Prop  
Connector Bracket Assembly  
Code : SBS-033  
Size : TBC  
Weight : TBC



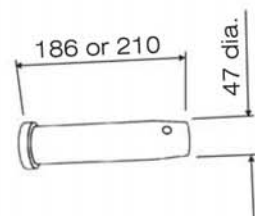
Clamp Plate  
Code : MBSP-009  
Size : 250 x 115 x 20  
Weight : 6 kg



Raking Prop Clamp Plate  
Code : SBS-030  
Size : 310 x 105 x 20  
Weight 5 kg



Corner Unit  
Code : SSB-015  
Size : 420 x 330 x 180  
Weight : 16 kg



Bailey Pin  
Code : TB-05  
Weight : 3 kg

## Accessories

- Air Powered Hydraulic Pump (Code : SSBA-003), Weight : 75 kg (full)
- 2 Leg Chain Sling (Code : SSP-SLING)  
Weight : 78 kg, 16mm chain, 5.0m ELL, c/w safety hooks and chain shorteners.
- Restraint Chain (Code : SSBA-004), Weight : 11.6 kg, 10mm Chain, 3m ELL, c/w forged hook, chain shortener, and 6.5T bow shackle for connection to lifting lug on waling (See Page 11)

Refer to Lifting Chain User Guide for further details on chain slings.



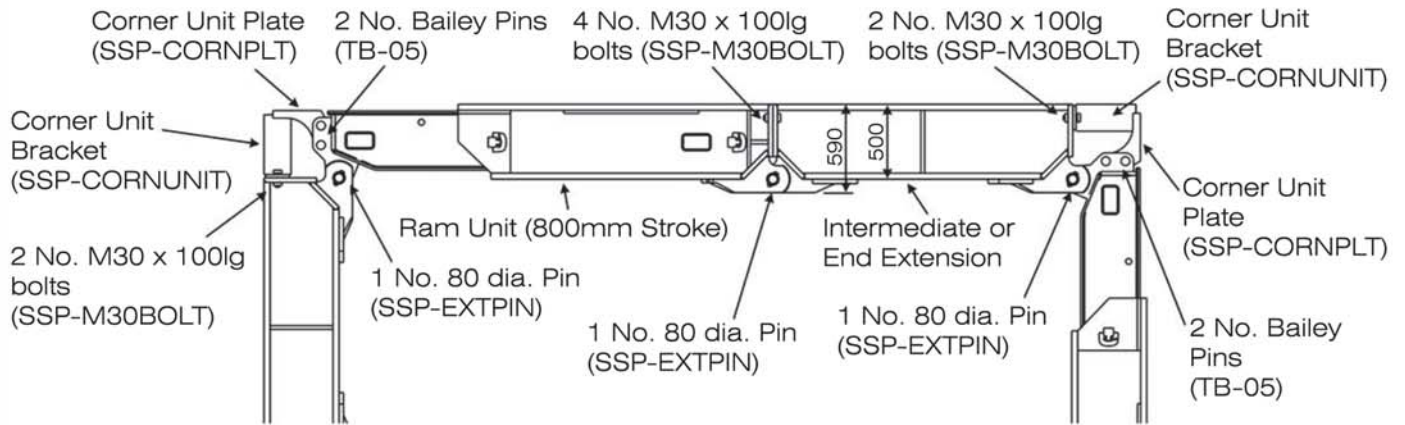
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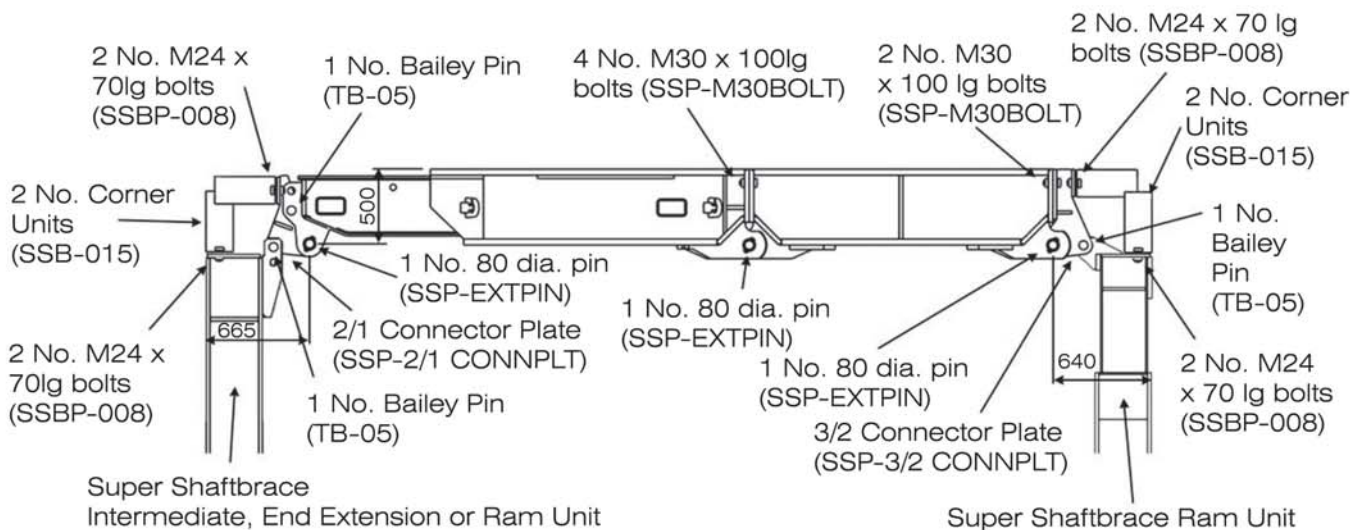
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## 8. Typical Waling Assembly and Site Connection Details

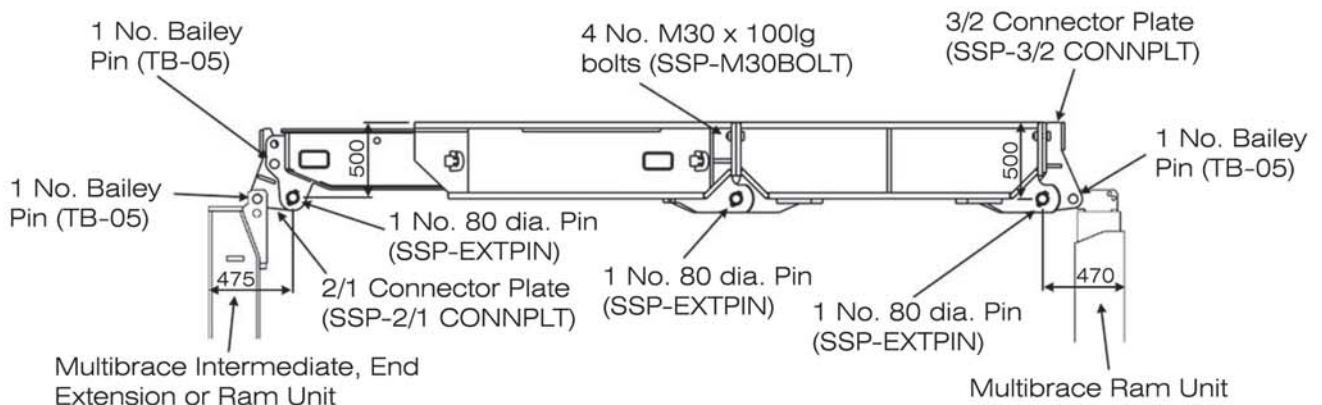
### Supershaft Plus to Supershaft Plus Connection Details



### Supershaft Plus to Super Shaftbrace Connection Details



### Supershaft Plus to Multibrace Connection Details



## 8.1 Assembly.

The legs of the brace are made to the correct length range where possible prior to delivery, so that only the corners and the corner bracketry need to be connected using 80 dia pins, Bailey pins, spring retention clips and bolts supplied.

The lug is a close fit in the clevis, so that the legs should be as level as possible during assembly to make it easier to assemble the joint.

It is worth spending some time on levelling the ground on which the frame is to be assembled.

If the legs have to be altered to another range on site, i.e. by adding or removing an extension section, the intermediate connection detail is used.

This consists of 1 No. 80 dia pin (SSP-EXTPIN) and 2 No. M16 x 100 long retaining bolts (SSP-M16BOLT), and 4 No. M30 x 100 long bolts (SSP-M30BOLT).

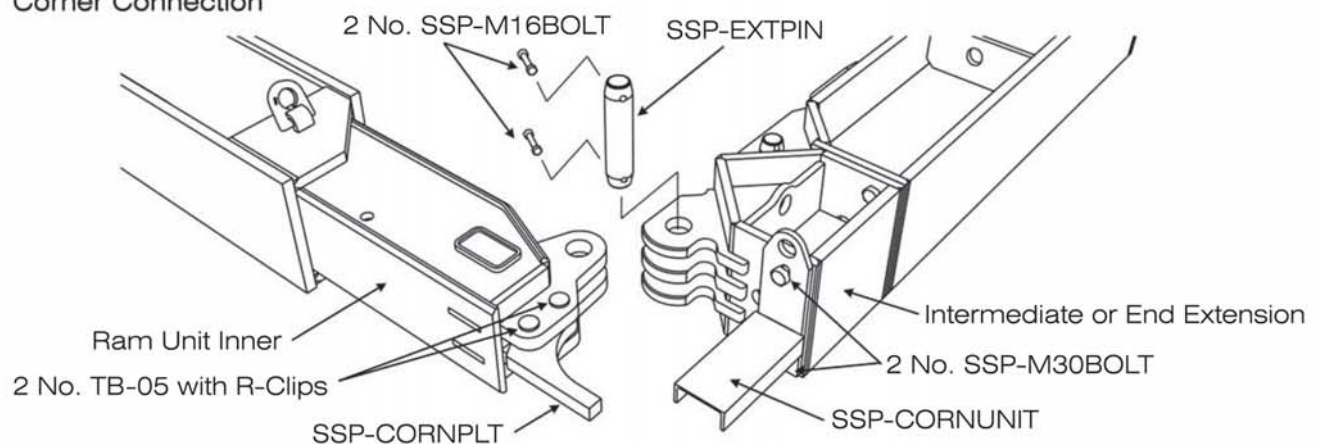
### IMPORTANT!

Before lifting each leg into the excavation:

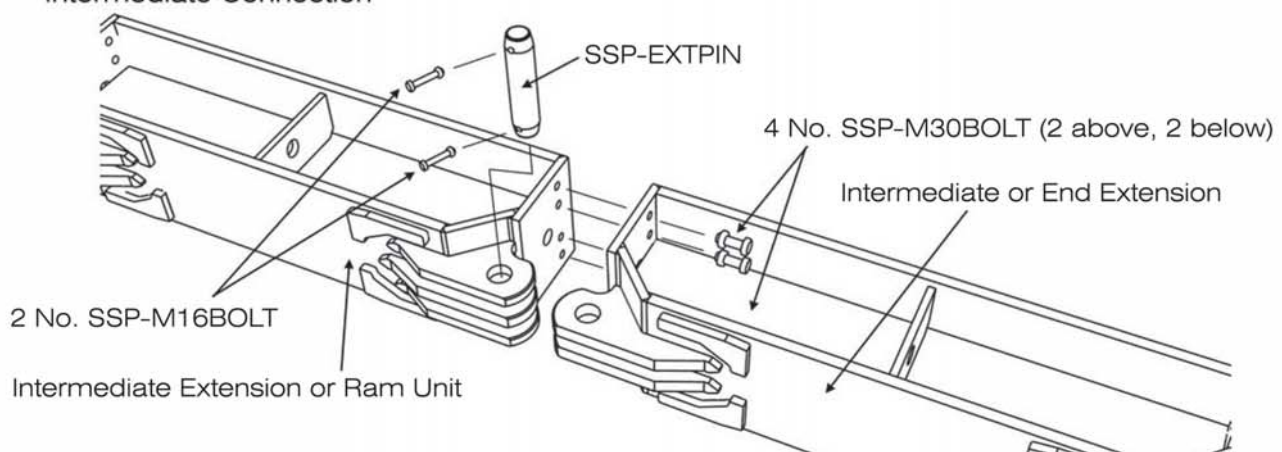
1. Ensure that 1 No. 80 dia pin is always fitted at each intermediate connection
2. Ensure that the correct bolt sizes are fitted and that bolts are fully tightened.

## 8.2 Site Connections for Supershaft Plus Waling.

### Corner Connection



### Intermediate Connection





## 9. Typical Sequence of Sheet and Frame Installation

NOTE: SUPERSHAFT PLUS EQUIPMENT IS NOT INTENDED TO BE INSTALLED OR REMOVED IN COMPLETE FRAMES – BUT ONLY AS DESCRIBED BELOW I.E. ONE LEG AT A TIME.

9.1 METHOD 1 : Installation of 2 frames by excavator, without piling hammer, placing one leg at a time.

**WARNING :** Refer to safety information on page 4 regarding excavators being used for lifting operations.

1. Fully excavate to first frame level.
- 1b. Alternatively excavate slit trench only to first frame level.

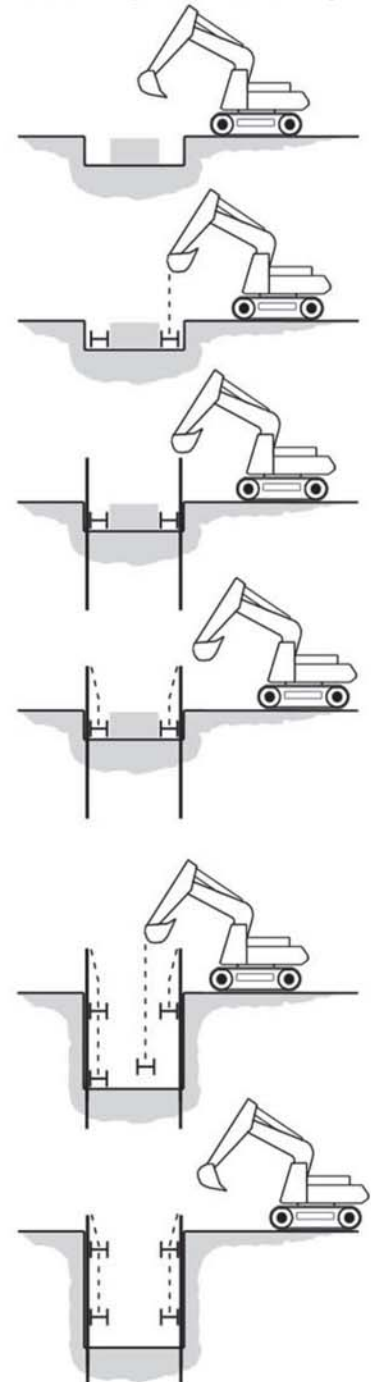
2. Place each extension in excavation and assemble the frame.  
Connect hydraulics and pump frame out to correct dimension.  
Remove hydraulics.

3. Using the frame and excavated face as a guide, place sheets and using the relevant drive cap drive with excavator bucket as far as possible.

4. Connect restraint chains as per scheme drawing.
5. Connect hydraulics and individually pressurise all frame ram units to 500 p.s.i., close lock-off valves and remove hydraulics.

6. Dig through to next frame position and push sheets down.
7. Reposition restraint chains as necessary.
8. Place extensions of second frame in excavation and assemble (safe working must be maintained).
9. Attach restraint chains between second frame and the top of the sheets / piling.
10. Connect hydraulics and individually pressurise all lower frame ram units to 500 p.s.i., close lock-off valves and remove hydraulics.

11. Push sheets down to give "toe-in" required and complete dig.



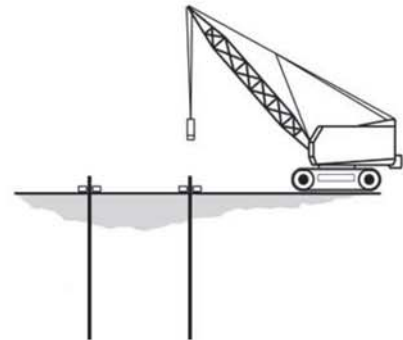
NOTE: 1. This method requires operatives working in the excavation and the contractor must ensure safe working conditions at all times.  
2. See Page 11 for notes on use of restraint chains.

NOTE: SUPERSHAFT PLUS EQUIPMENT IS NOT INTENDED TO BE INSTALLED OR REMOVED IN COMPLETE FRAMES – BUT ONLY AS DESCRIBED BELOW I.E. ONE LEG AT A TIME.

## 9.2 METHOD 2 : Installation of 2 frames by crane and excavator, fully driving sheets / piling with piling hammer.

Use the crane for lifting and driving operations and the excavator for digging operations.

1. Fully drive sheets/piling using a piling hammer.



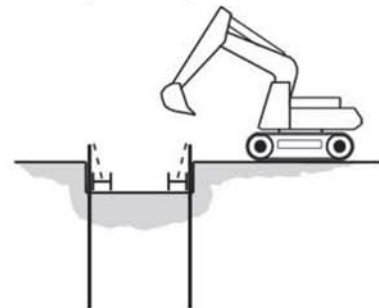
2. Remove piling guide and excavate to first frame level.

3. Weld angle brackets to the piling if required to support the frame.

4. Place each extension in excavation and assemble the frame.

5. Connect restraint chains.

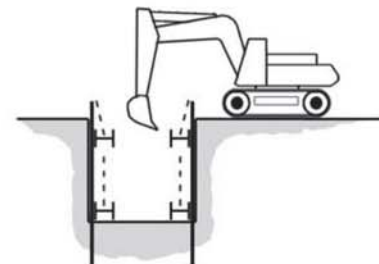
6. Connect hydraulics and individually pressurise all ram units to 500 p.s.i., close lock-off valve and remove hydraulics.



7. Dig through to next frame position.

8. Weld angle brackets to the piling if required to support the frame.

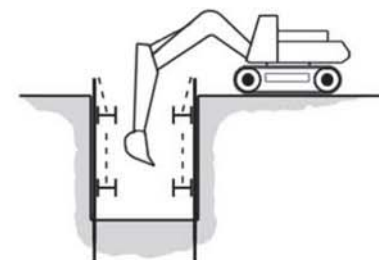
9. Place extensions of second frame in excavation and assemble (safe working must be maintained).



10. Attach restraint chains between second frame and the top of the sheets/piling.

11. Connect hydraulics and individually pressurise all lower ram units to 500 p.s.i., close lock-off valve and remove hydraulics.

12. Complete dig.



NOTE: 1. This method requires operatives working in the excavation and the contractor must ensure safe working conditions at all times.

2. See Page 11 for notes on use of restraint chains.

## 10. Removal of Frames

Backfill to the underside of the lowest frame and carry out any compaction required. Ensure frame is securely packed or supported from below. Connect hydraulics and individually open lock-off valves (max 2 turns) and fully retract all lower frame ram units. Remove restraint chains. Remove joint pins and bolts as required, attach lifting sling to lifting eyes and lift each extension one at a time from excavation. Follow the above procedure for the upper frame.

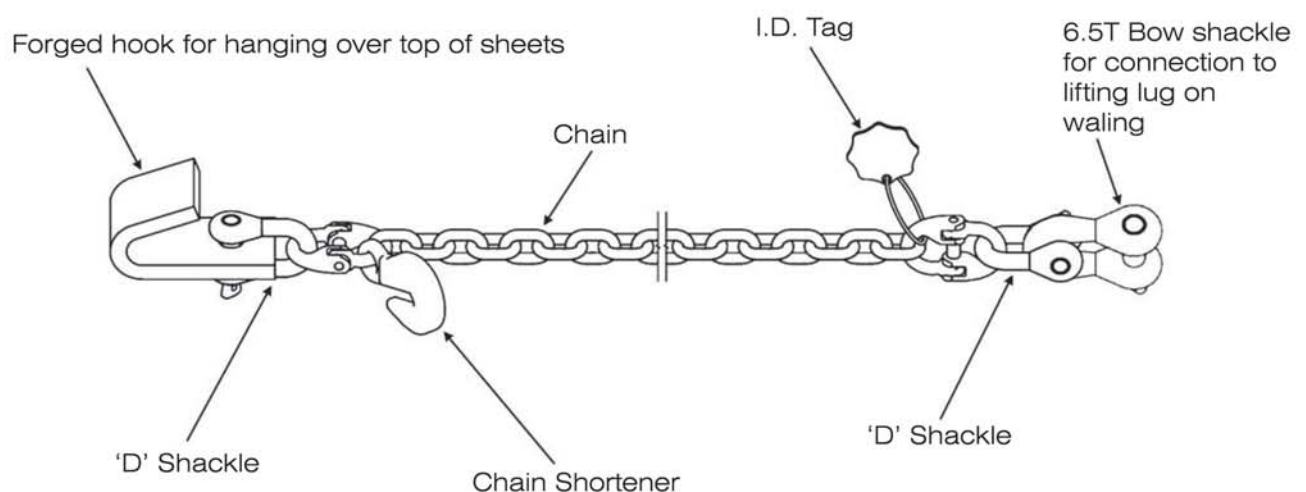
When the frames have been removed and the excavation backfilled, the sheets can be removed, one at a time using a trench sheet extractor.

## 11. Use of Restraint Chains (SSBA-004 c/w 6.5T Bow Shackle) Capacity 3.2T\*

Restraint chains are provided as a back-up support arrangement in the unlikely event of hydraulic failure of one of the Supershaft Plus hydraulic legs. They are NOT to be used for any other purpose and particularly, are NOT to be used as lifting chains. They are NOT intended as a means of suspension to be relied upon during installation or removal of the frames.

Always ensure all the restraint chains are fitted as per arrangement shown on the scheme drawing, or if no scheme has been prepared 1 No. chain every 2.5m approx of waling, and that as much slack as possible is removed using the chain shorteners.

Users must ensure that frames are securely supported by means other than the restraint chains prior to depressurising the frames.





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## 12. Frame Dimensions and Leg Weights

Leg Arrangement	Leg Code	Clear Internal Dimensions (see notes below)				Corner Pin to Pin Dimension (mm)		Dimension to face of sheet (mm)		Approx. max. Deflection per waling (mm)	Approx. Weight of one Leg (kg)
		Between Waling Flanges except at intermediate connection (mm)		Between Walings at intermediate connection (mm)							
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.		
SSP-HYDUNIT	SSPL-01	2000	2800	N/A	N/A	2000	2800	3000	3800	15	1925
SSP-HYDUNIT+SSP-05	SSPL-02	2500	3300	2320	3120	2500	3300	3500	4300	15	2296
SSP-HYDUNIT+SSP-1	SSPL-03	3000	3800	2820	3620	3000	3800	4000	4800	15	2496
SSP-HYDUNIT+SSP-1+SSP-05	SSPL-04	3500	4300	3320	4120	3500	4300	4500	5300	15	2867
SSP-HYDUNIT+SSP-2	SSPL-05	4000	4800	3820	4620	4000	4800	5000	5800	15	2888
SSP-HYDUNIT+SSP-2+SSP-05	SSPL-06	4500	5300	4320	5120	4500	5300	5500	6300	15	3259
SSP-HYDUNIT+SSP-2+SSP-1	SSPL-07	5000	5800	4820	5620	5000	5800	6000	6800	15	3459
SSP-HYDUNIT+SSP-2+SSP-1+SSP-05	SSPL-08	5500	6300	5320	6120	5500	6300	6500	7300	18	3830
SSP-HYDUNIT+SSP-2+SSP-2	SSPL-09	6000	6800	5820	6620	6000	6800	7000	7800	22	3851
SSP-HYDUNIT+SSP-2+SSP-2+SSP-05	SSPL-10	6500	7300	6320	7120	6500	7300	7500	8300	28	4222
SSP-HYDUNIT+SSP-5	SSPL-11	7000	7800	6820	7620	7000	7800	8000	8800	34	4031
SSP-HYDUNIT+SSP-5+SSP-05	SSPL-12	7500	8300	7320	8120	7500	8300	8500	9300	43	4402
SSP-HYDUNIT+SSP-5+SSP-1	SSPL-13	8000	8800	7820	8620	8000	8800	9000	9800	49	4602
SSP-HYDUNIT+SSP-5+SSP-1+SSP-05	SSPL-14	8500	9300	8320	9120	8500	9300	9500	10300	54	4973
SSP-HYDUNIT+SSP-7	SSPL-15	9000	9800	8820	9620	9000	9800	10000	10800	59	4803
SSP-HYDUNIT+SSP-7+SSP-05	SSPL-16	9500	10300	9320	10120	9500	10300	10500	11300	65	5174
SSP-HYDUNIT+SSP-7+SSP-1	SSPL-17	10000	10800	9820	10620	10000	10800	11000	11800	76	5374
SSP-HYDUNIT+SSP-7+SSP-1+SSP-05	SSPL-18	10500	11300	10320	11120	10500	11300	11500	12300	82	5745
SSP-HYDUNIT+SSP-7+SSP-2	SSPL-19	11000	11800	10820	11620	11000	11800	12000	12800	88	5766
SSP-HYDUNIT+SSP-7+SSP-2+SSP-05	SSPL-20	11500	12300	11320	12120	11500	12300	12500	13300	95	6137
SSP-HYDUNIT+SSP-10	SSPL-21	12000	12800	11820	12620	12000	12800	13000	13800	102	5976
SSP-HYDUNIT+SSP-10+SSP-05	SSPL-22	12500	13300	12320	13120	12500	13300	13500	14300	109	6347
SSP-HYDUNIT+SSP-10+SSP-1	SSPL-23	13000	13800	12820	13620	13000	13800	14000	14800	117	6547
SSP-HYDUNIT+SSP-10+SSP-1+SSP-05	SSPL-24	13500	14300	13320	14120	13500	14300	14500	15300	125	6918
SSP-HYDUNIT+SSP-10+SSP-2	SSPL-25	14000	14800	13820	14620	14000	14800	15000	15800	133	6939
SSP-HYDUNIT+SSP-10+SSP-2+SSP-05	SSPL-26	14500	15300	14320	15120	14500	15300	15500	16300	142	7310
SSP-HYDUNIT+SSP-10+SSP-2+SSP-1	SSPL-27	15000	15800	14820	15620	15000	15800	16000	16800	155	7510
SSP-HYDUNIT+SSP-10+SSP-2+SSP-1+SSP-05	SSPL-28	15500	16300	15320	16120	15500	16300	16500	17300	164	7881
SSP-HYDUNIT+SSP-10+SSP-2+SSP-2	SSPL-29	16000	16800	15820	16620	16000	16800	17000	17800	174	7902
SSP-HYDUNIT+SSP-10+SSP-2+SSP-2+SSP-05	SSPL-30	16500	17300	16320	17120	16500	17300	17500	18300	183	8273
SSP-HYDUNIT+SSP-10+SSP-5	SSPL-31	17000	17800	16820	17620	17000	17800	18000	18800	193	8082
SSP-HYDUNIT+SSP-10+SSP-5+SSP-05	SSPL-32	17500	18300	17320	18120	17500	18300	18500	19300	203	8453
SSP-HYDUNIT+SSP-10+SSP-5+SSP-1	SSPL-33	18000	18800	17820	18620	18000	18800	19000	19800	214	8653
SSP-HYDUNIT+SSP-10+SSP-5+SSP-1+SSP-05	SSPL-34	18500	19300	18320	19120	18500	19300	19500	20300	224	9024
SSP-HYDUNIT+SSP-10+SSP-7	SSPL-35	19000	19800	18820	19620	19000	19800	20000	20800	235	8854
SSP-HYDUNIT+SSP-10+SSP-7+SSP-05	SSPL-36	19500	20300	19320	20120	19500	20300	20500	21300	247	9225
SSP-HYDUNIT+SSP-10+SSP-7+SSP-1	SSPL-37	20000	20800	19820	20620	20000	20800	21000	21800	263	9425
SSP-HYDUNIT+SSP-10+SSP-7+SSP-1+SSP-05	SSPL-38	20500	21300	20320	21120	20500	21300	21500	22300	275	9796
SSP-HYDUNIT+SSP-10+SSP-7+SSP-2	SSPL-39	21000	21800	20820	21620	21000	21800	22000	22800	287	9817
SSP-HYDUNIT+SSP-10+SSP-7+SSP-2+SSP-05	SSPL-40	21500	22300	21320	22120	21500	22300	22500	23300	300	10188
SSP-HYDUNIT+SSP-10+SSP-10	SSPL-41	22000	22800	21820	22620	22000	22800	23000	23800	312	10027
SSP-HYDUNIT+SSP-10+SSP-10+SSP-05	SSPL-42	22500	23300	22320	23120	22500	23300	23500	24300	325	10398
SSP-HYDUNIT+SSP-10+SSP-10+SSP-1	SSPL-43	23000	23800	22820	23620	23000	23800	24000	24800	339	10598
SSP-HYDUNIT+SSP-10+SSP-10+SSP-1+SSP-05	SSPL-44	23500	24300	23320	24120	23500	24300	24500	25300	352	10969

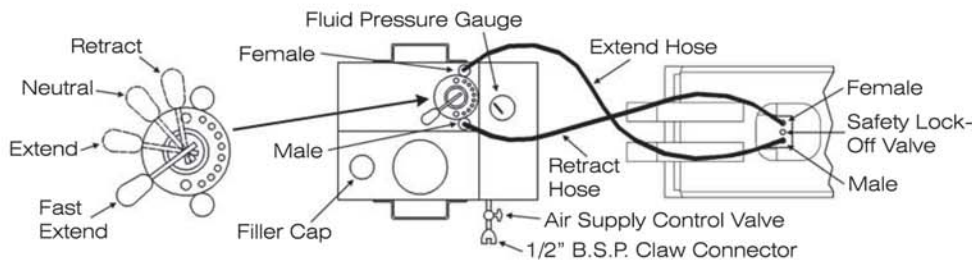
- Notes: 1. The clear internal dimensions shown above do not include any allowance for deflection of the walings under load.  
2. These waling deflections are listed separately above and generally it will be necessary to increase the clear internal dimensions by twice the appropriate waling deflection.  
3. Items denoted "N/A" in the table = Not Applicable.

## 13. Mechanical Pump Details and Procedures for Extending / Retracting Walings

### 13.1 Introduction

It is advisable before commencing installation to read the notes below to become familiar with the procedures involved.

The diagram below shows the pump control, gauge, hose connections and safety lock-off valve referred to in the procedures.



### 13.2 Preliminaries

1. Check there is sufficient of the correct Mabey Hire Services shoring fluid in the tank. Only Mabey Hire Services shoring fluid should be used.
2. Set the pump control valve to "Neutral".
3. Connect the pump to a suitable air supply (100 p.s.i. at 14 cu ft/min), secure the air supply hose to the pump using the whip check hose and open air supply control valve on pump.
4. Purge the hoses of air. To do this, connect the hoses together and run the pump for a few seconds with the control valve set to "Extend". When satisfied that any air has been expelled, set the pump control valve to "Neutral".
5. At no time must the pump be left operating whilst unattended.

### 13.3 Mabey Hire Services shoring fluid

The pump is normally supplied with a full tank of pre-mixed fluid. If the fluid is separately supplied "neat" in 5 litre orange coloured containers, it should be poured into the pump and cold clean water added according to prevailing temperature conditions. (See table right). Protective gloves should always be worn when handling shoring fluid.

Temp Range (°C)	Shoring Fluid (litres)	Water (litres)
Above 0	5	20
-6 to 0	10	20
-10 to -7	15	15
-10 and below	Neat fluid only	

### 13.4 Procedure for extending walings to predetermined lengths - either prior to assembly into frames, or to set an assembled frame to a given size

1. Ensure each waling is set up level and safely on packs just clear of the ground so that it will be free to extend.
2. Set the pump control valve to "Neutral" and ensure air supply valve is open.
3. Connect the pump hoses to the ram unit of the waling.
4. Open the safety lock-off valve on the waling (by rotating anti-clockwise).
5. Set the pump control valve to "Extend".
6. Watch the waling extend to the required length.
7. Shut down the pump by closing off the air supply valve.
8. Close the safety lock-off valve on the ram unit (by rotating clockwise).
9. Set the pump control valve to "Neutral".
10. Disconnect the pump hoses from the ram.



## 13.5 Procedure for extending and pressurising walings of a previously installed frame against the sheets of an excavation

1. Ensure all restraint chains are in place and the frame is level.
2. Set the pump control valve to "Neutral" and ensure air supply valve is open.
3. Connect the pump hoses to the ram unit of the first waling.
4. Open the safety lock-off valve (by rotating anti-clockwise).
5. Set the pump control valve to "Extend".
6. Watch the waling extend until the pump gauge starts rising indicating that the frame is beginning to push against the sheets.
7. Allow the pressure to build up to 500 p.s.i. corresponding to a waling load of about 9 tonnes. Shut down the pump by closing off the air supply valve. Check that the hydraulic pressure is being maintained on the gauge.

**NOTE: DO NOT MOVE THE PUMP CONTROL VALVE TO NEUTRAL AT THIS STAGE AS THIS WILL SIMPLY RELEASE THE PRESSURE.**

8. Close the safety lock-off valve (by rotating clockwise).
9. Set the pump control valve to "Neutral".
10. Disconnect the pump hoses from the ram.
11. Repeat steps 3-10 for each waling of the frame in turn.

## 13.6 Procedure for releasing walings and retraction

1. Ensure the waling is secured against dropping before setting about releasing.
2. Set the pump control valve to "Neutral" and open the air supply valve.
3. Connect the pump hoses to the ram unit of the waling.
4. Slowly open the safety lock-off valve to release the hydraulic fluid pressure and allow fluid to flow back through the pump.
5. To release frames, it will be necessary to retract the walings in turn by setting the pump control valve to "Retract".
6. On completion of retraction close off the air supply valve and set the pump control valve to "Neutral".
7. Close lock-off valve in ram unit and disconnect pump hoses from the ram.

## 14. Do's and Don'ts

DO install the legs of each frame one at a time.  
DO install frames as level as possible.  
DO use restraint chains between each frame to the top of the sheets.  
DO ensure the lock-off valves are open prior to pumping.  
DO ensure that the pressure is being held on the rams before closing the lock-off valves.  
DO release the pump pressure after closing the lock-off valves to ease removal of hoses.  
DO keep the couplers of the hoses dirt free by clipping male and female ends together after use.

DO NOT attempt to install or remove by lifting complete frames.  
DO NOT over pressurise the system as this can damage the rails.  
DO NOT pressurise a frame with a large gap between the rails and the sheets. A packer must be inserted to fill the gap first.  
DO NOT attempt to disconnect a hose until the lock-off valve has been fully closed, and pressure has been released at the pump.  
DO NOT release ram pressure by depressing or striking the coupler nipple.  
DO NOT use restraint chains as a means of suspension during installation or removal of the frames.

## 15. General

Since our policy is one of continual improvement, components may vary in detail from the descriptions given in this publication.





all the support you need

## User Information Appendix A : Provision of a Mabey Hire Services Site Demonstrator

Mabey Hire Services can, subject to availability, offer the services of a Site Demonstrator. However, the Customer should note the following :-

### A1. The Customers Responsibilities

A safe system of work remains the Customers responsibility at all times. It is his responsibility to prepare for, organise and direct the operation including :-

A1.1 Site induction for the demonstrator.

A1.2 Preparation of a method statement.

A1.3 A risk assessment.

A1.4 Selection of lifting equipment and any other equipemnt required to undertake the work.

A1.5 Positioning of the crane or lifting appliance.

A1.6 Banking the crane.

A1.7 Slings the components.

A1.8 Assembling the components and installing them.

### A2. Activities which the Mabey Hire Services Demonstrator is authorised to carry out

Mabey Hire Services Demonstrator is authorised to :-

A2.1 Assist in indentification of Mabey Hire Services components.

A2.2 Explain how they fasten together.

A2.3 Point out slinging points and special methods of lifting as noted in the user information.

A2.4 Demonstrate how to attach hoses and use pumps to extend/retract hydraulic braces.

A2.5 Draw attention to the content of the user information.

A2.6 Clarify queries with Mabey Hire Services scheme drawings.

The Demonstrator is NOT AUTHORISED to 'take over' or direct the installation.

To : Mabey Hire Services Limited  
[Address]

From \_\_\_\_\_

Site \_\_\_\_\_

Tel.No. \_\_\_\_\_ Fax No. \_\_\_\_\_

Tel.No. \_\_\_\_\_ Fax No. \_\_\_\_\_

### Provision of a Mabey Hire Services Demonstrator on site

We confirm receipt of your User Information Appendix A and that we would like to request the services of your Demonstrator on \_\_\_\_\_ date(s).

Signed \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_